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ABSTRACT

Stimulated recall methodology in which the student actively recalls thoughts and reactions to a teaching/learning experience provides analytical data which can be used by the researcher in the process of developing and improving an individualized teaching system. This paper describes the application of stimulated recall to the evaluation of a video tape on human physiology and paramedical laboratory skills. Student thoughts and reactions to the tape are presented with a discussion of how this information will assist in improving the tape. (Author/STS)

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STIMULATED RECALL: A METHOD FOR THE ANALYSIS AND IMPROVEMENT OF INDIVIDUALISED INSTRUCTIONAL SYSTEMS. A PAPER

by

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STIMULATED RECALL : A METHOD FOR THE ANALYSIS AND IMPROVEMENT OF INDIVIDUALISED INSTRUCTIONAL SYSTEMS

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ABSTRACT

Stimulated recall methodology - in which the student actively recalls thoughts and actions of a teaching/learning experience - provides analytical data which can be used by the researcher in the process of developing and improving an individualised teaching system. The information generated is grounded in the real experiences of those who took part in the teaching/learning situation. In the process of data generation, the researcher is not imposing his/her fairly theoretical reality upon the student, but is being confronted with the student's own reality.

The data thus obtained can be used to help design, produce and improve individualised teaching materials such as video-tapes, tape-slide packages, etc.

This paper describes the application of stimulated recall to the evaluation of a video-tape on human physiology and para-medical laboratory skills. The results are discussed and it is shown how the ideas and information obtained from the stimulated recalls make it possible for the researcher to improve such tapes by responding to the learning experiences of the very audience for which the teaching material is designed.

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What is Stimulated Recall ?

Stimulated recall is a method of evoking students' thoughts and reactions to individualised learning material which occurred AT THE TIME THE STUDENTS USED THE LEARNING MATERIAL.

Stimulated recall was originally devised as a method of evoking records of students' in-class thought processes[1][2], but the description here is a modification of that technique which allows researchers to obtain critical, analytical data about the effectiveness of individualised learning materials - such as video-tapes, tape slide packages and so on - which will help them design, produce and improve new varieties of such learning materials.

The technique involves students' recalling their thoughts and actions about, and reactions to the individualised teaching material as they had occurred while using the material; this is achieved by confronting the students with a series of sections taken from the learning material (used within the previous 24 hours) and asking them to recall the thoughts they had experienced during the original situation. The sections chosen are termed critical points, and usually exemplify particularly important or novel aspects of the individualised material, such as the use of a special visual aid; the superimposition of data or labels over a diagram in a TV program; the use of split screens to teach specific points, and so on. In any case, the critical points are chosen to allow the researcher to assess and evaluate their impact on the students and their usefulness as teaching strategies in individualised learning materials.

The present concern of the "new wave" of educational evaluators encourages the researcher to be responsive to the context of the program being evaluated and to the students' learning difficulties[3]. Stimulated recall, as an evaluation method, is particularly responsive to the learning experiences of students taking an individualised course. Researchers employing this method are concerned about the learners' problems and difficulties and their reactions to the individualised material; they are anxious not to bias in advance students' remarks about the material and are eager to know about both the effectiveness of the material and its failings. The whole spectrum of students' thoughts about, and reactions to the individualised program are potentially available to researchers employing stimulated recall, providing them with a similarly wide range of data which can be used to redesign existing individualised packages or design and produce future ones.

Using stimulated recall

At the University of Surrey, students taking the human biology course are instructed in physiological and para-medical practical skills by pre-recorded video-tapes which demonstrate and teach the practical work which the students are to perform in the laboratory. The system is described elsewhere in a video-tape accompanying this paper. Up to about 10 students may watch one video-tape at the same time, with pairs of students viewing the demonstration on a 12" monitor, each student having individual headphones and adjusters.

As part of my research, I was involved in designing and producing a self-instructional video-tape entitled "An Introduction to Haematology", which was divided into four teaching sections, viz:

1. The Red Cell Count.
2. Determination of Haemaglobin Concentration.
3. Haematocrit - packed cell volume.
4. Differential White Cell Count.

each section demonstrating the practical skills necessary to perform the laboratory work.

In the evaluation of the video-tape, I wanted to obtain specific information on the effectiveness of various TV teaching strategies which had been employed in the tape without biasing the viewers as to what I was interested in; a pre-knowledge of the specific aims of the stimulated recall session would cue the students into presenting information which they think the researcher is after, thus reducing the spontaneity and uniqueness of personal reflection which I was eager to tap. Also, since I hoped that the video-tape might stimulate students thought processes in some pertinent way, I was keen to get some indication of students thoughts as they watched the program.

Previous to using stimulated recall as an evaluation tool, I had used questionnaires and evaluation forms to assess other video-tapes, but these methods only produced data of a rather general evaluative nature which lacked any really precise analytical information about the effectiveness of the video-tapes. Stimulated recall seemed to be a method which had the potential for allowing a thorough critical analysis of the teaching strategies used in the tape which in turn would provide the sort of

precise information needed to design, produce and improve future video-tapes.

An illustration through the analysis of one critical point

Every week, throughout a period of five weeks during which groups each of about six first year students viewed the tape, the students were asked if they would take part in the research project. Eighteen volunteered, and within 24 hours of viewing the tape took part individually in the stimulated recall sessions.

Seven critical points were chosen from the tape, each lasting for anything between 90 seconds and 2½ minutes and chosen for its particular use of the TV teaching medium. The students were told that while viewing each critical point, they should put themselves back in the laboratory situation and try and remember what they were thinking about or doing while viewing that part of the tape. After watching each critical point, the students related their thoughts and actions which were tape-recorded for later transcription and analysis.

I would like to illustrate the stimulated recall method by analysing one critical point taken from the video-tape, and then discuss the specific conclusions from this analysis and indicate the utility of the method in achieving the two evaluation aims stated earlier.

The critical point is taken from the beginning of the tape (on the Red Cell Count) which deals with putting a cover-slip on to a special slide called a haemocytometer. The main sections are:

1. Close-up of the technique involved to show clearly the correct procedure of placing the cover-slip on to the haemocytometer.

2. Checking for interference patterns - the student should be able to see these on the slide if the cover-slip has been put on properly.

3. Importance of securing the cover-slip, ensuring a height of 0.1 mm; discussing volumes.

Let us have a look at the critical point then I will discuss the students' reactions to it.

VIDEO-TAPE EXTRACT, SHOWING
THE CRITICAL POINT

2 minutes

The first section of the critical point - the technique of putting the coverslip on to the haemocytometer - caused some confusion. After watching the demonstration several students still did not understand how to put the cover-slip on; was it to be slipped on from one side, dropped on from the top or what ? Although it seemed a fairly straightforward technique to most of the other students, several failed to perform it correctly in the laboratory and had to seek a demonstrator's help.

Along with the confusion, another factor which emerged was the effect that the video demonstration had on the students' attitude to their own ability to correctly carry out the technique being demonstrated. Some students had questionned their ability to put the cover-slip on to the haemocytometer properly without breaking it. Apparently, this appeared to be fairly straightforward when demonstrated on the tape, but these students knew from previous experience with using cover-slips that they might have difficulty in performing it correctly.

The second section of the critical point - checking for interference patterns - was considered clear and straightforward. Only three students could not see interference patterns when they came to do the experiment themselves, but were able to carry on nevertheless.

One of the aims of this video-tape was to stimulate the students into some active, relevant thought processes while viewing the tape, so that they are not sitting just listening and watching passively. This is deliberately contrived at times, for example, by asking the student to examine a piece of equipment on the bench or refer to a table in the laboratory schedule (instructions book). This was not a deliberate aim of this section, but it seems nevertheless that at this point there

was a certain amount of active thought produced; the students were stimulated into thinking back to previous school work on physics where they had first come across interference patterns. Thus it appears from the analysis of the stimulated recall protocols, that they tried to relate their previous knowledge of interference patterns to the present practical work, and gain some insight into the need for producing such patterns on the cover-slip.

The third section - on securing the cover-slip and discussing volumes - was particularly ineffective; most students found it boring and irrelevant. Even though some commented that the diagram was useful, and although several students took the trouble to write the height of the cover-slip above the grid into their laboratory schedule for later reference, the general feeling was that anything discussed at this point was superfluous; the students felt they could easily look up the details of this section in their schedule later on when they needed it, so they "switched off". This is a reaction which occurred at similar points throughout the tape : if something was being described or discussed which was obviously in the laboratory schedule also, and which did not directly relate to what the student was about to do in the laboratory, then the typical reaction was to "switch off" and not pay attention. It was considered superfluous by the students, so they "switched off" and in a sense <u>made</u> it superfluous.

Discussion

How far does an analysis such as this help in evaluating materials used in independent learning ? For the critical point just discussed we can begin to answer this question by assessing to what extent the two evaluation aims posed earlier have been achieved. You may remember that these evaluation aims were:

1. To obtain information on the effectiveness of the various TV teaching strategies employed in the tape.

2. To get some indication of students' thoughts while viewing the tape.

In section I of the critical point - which showed a close-up of the technique involved in placing the cover-slip on to the haemocytometer - the stimulated recall analysis indicated that the demonstration is rather ineffective and that the STEPS of the technique should be described and illustrated more fully. We have to consider also the point regarding students' lack of confidence in performing the technique - how can we help them overcome this ?

TABLE I

CRITICAL POINT ANALYSIS

Placing the cover-slip on to the haemocytometer

SECTION	OUTLINE	COMMENTS
I	Close-up technique involved: placing cover-slip on to haemocytometer.	Needs improving - describe and illustrate the STEPS of the technique. How to boost students' confidence in performing technique correctly ?
2	Checking for interference patterns on cover-slip.	Visuals O.K. Active, relevant thought stimulated; relating interference patterns to previous knowledge.
3	Securing cover-slip 0.1 mm above grid; discussing volumes.	Diagram "useful" but students "switched-off" - is this section really necessary in VT (already in laboratory schedule).

The visuals used in section 2 are fine, and at this point we also got some information on students' thought processes - which fulfills the second of the evaluation aims. Again, in section 3, the diagram was considered "useful", but the students "switched off" at this point because they considered this part of the tape superfluous. The researcher has to question the relevance of this section and ask if it is really vital for what the students are about to do in the laboratory - if it is not, then why is it included ? (qv Table I).

The analysis of just one critical point, therefore, gives a fair indication of the utility of stimulated recall in achieving the two evaluation aims; precise details of students' reactions to the teaching strategies used in the critical point are obtained as well as an indication of the thoughts which were passing through their minds as they watched the video-tape. This data can be used to improve the tape at this particular point by incorporating the changes and ideas in the above table into a remake of the tape.

The analysis of one critical point has illustrated the technique of stimulated recall as an evaluation method - this has been the main aim of this paper - to illustrate the technique of stimulated recall. Time does not permit me, however, to discuss the sort of data which can be generated from a complete analysis of the protocols of all the critical points in all the stimulated recall sessions - data which provides both a qualitative and quantitative evaluation of students attitudes to the individualised learning material. Perhaps this can be discussed in the questions time, if desired.

What I hope this paper has achieved is to have given you an indication of the quality of stimulated recall for analysing and improving individualised learning material. I have tried to show that the information obtained by stimulated recall methodology reflects the students reality of the learning situation, and is consequently qualitatively superior to other less responsive evaluation techniques, thus providing detailed, analytical data suitable for the design, production and improvement of new individualised learning materials.

Notes

(1) BLOOM, B. S., "Thought Processes in Lectures and Discussions", J. Gen. Educ. 1953.-VII (3) : 160 - 169.

(2) SIEGEL, L. et al. "Students' Thoughts During Class : a criterion for educational research". J. Educ. Psychol. 1963 54(1) : 45 - 51.

(3) For example, the work of Robert Stake in America and Malcolm Parlett in Great Britain, besides others.